1. PROJECT CODE		ODE	2. JPIC CODE				AMS-02 TA	ASK SHEET (A	(ST			
	SA-A	MS	AMS				AWO-02 17	OR OHELT (A	(10)			
3.	Α	CONFIGU	RATION CHANGE		$\boxtimes$	4. ATS NO. <b>T</b> ]	TCS-090908-01		5. PAGE	1	OF	36
T Y	PERMA	NENT	TEMPORA	\RY		6. MOD SHEET(S	) NUMBER(S)					
P E	В	NONCON	FIGURATION CHANGE			R1						
	PART NAM					tector Name		12. SERIAL/LOT NO.				
		& TTCB-		TTO	CS_			NA				
14.	APPLICAB	BLE DOCUME	:NIS									
	ATS TITLE		INSTALLATIO	ON								
	. OPER EQ. NO.				(	21. OPERATION Print, Type, or Write L				VEI	RIFICA	TION 23. QA/DV
NOTE CAUTION WARNING  THIS ATS COVERS THE INTEGRATION STEPS NEEDED FOR THE INSTALLATION OF THE TTCS-CONDENSERS												
This ATS authorized lifting operation. All safety regulations and procedures shall be followed.  Proper Personal Protection Equipment (PPE) is required for the operations. See the CERN/SCL safety regulations and instructions.												
		aı	nd/or within th	ie AMS0	2 a , m	ssembly ar	t within the TTC ea, during the in and all items not ools.	tegration; for				
		The	purpose of this			pecify the T I be done at	TCB-P & TTCB- CERN.	-S installation th	nat			
		The	Project Engine				or Tracker/TTCS as required.	) has the option	to			
	originat van E		/E. Laudi ( INF	FN)		DATE	25. FINAL ACCEPTANCE S	TAMP AND DATE	1		1	
					Α	PPROVALS (Printed	or Typed and Signed)	·				
		ENGINEER S (NLR	)			DATE	27. QUALITY ENGINEER				DATE	
	.Gargi	ulo (IN	FN)				A.Pauw (NLR)					
30.							31.					

#### 

20. OPER	21. OPERATIONS (Print, Type, or Write Legibly)	VERIFIC	CATION
SEQ. NO.		22. TECH	23. QA/DV

#### **WARNING**

#### STANDARD AND SPECIAL TOOLS

For the hardware installation a standard tool shall be used. Where the use of standard tooling is not possible, special tool may be employed. Each special tool has to be identified with its Drawing Number marked, in indelible way, on the same tool. All the tools have to be clean and free from dust and grease. For the present installation only standard tools are needed.

### **RUNNING TORQUE MEASUREMENT**

This value is an output from Specification MIL-I-45914A see below table.

MIL-I-45914A

TABLE I. Internal thread self-locking torque (inch-pounds).

Insert Internal Thread Fine or Coarse	Maximum Locking Torque	Minimum Breakaway Torque
.086	2.5	.2
.112	5	.5
.138	10	1.0
.164	15	1.5
.190	18	2.0
.250	30	3.5
.3125	60	6.5
.375	80	9.5
.4375	100	14.0
.500	150	18.0
.5625	200	24.0
.625	300	32.0
.750	400	50.0
.875	600	70.0
1.000	800	90.0

Table 1: Running torque values according to MIL-I-45914A

Since it is a continuous torque it is necessary to measure it with an analogical torque wrench, obtaining the maximum torque applied during this operation. The Locking Torque value has to be written in the relative box in the Integration Procedure Table and added to the Seating Torque required in the structural analysis, and listed in Appendix C.

### 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER 21 OPERATIONS SEQ. NO (Print, Type, or Write Legibly) 22. TECH 23. QA/DV The following Step by Step procedure, have to be followed for all the fittings to be used for the TTCB-P and TTCB-S installation. **STEP OPERATION** Clean screws, nuts and washers in an Isopropyl Alcohol 1 bath 2 Let screws, nuts and washers dry on a clean towel 3 Remove protecting tape from I/F areas Perform a screws, nuts and washers visual Inspection to 4 check if any non conformance is present Install the part on the AMS02 hardware and tight by 5 hand (or using an appropriate L-shape wrench/ Hex Tip screwdriver), screws and nuts Measure the Locking Torque and register the value in 6 this ATS FINAL INSTALLATION TORQUE MEASUREMENT Final Torque to be applied to each screw is the result of the sum of the Locking Torque (measured) and the Seating Torque prescribed from the structural analysis (and reported also on the assembly drawing). The entire torque shall be applied using calibrated torque wrench TORQUE (T) = SEATING TORQUE (ST) + LOCKING TORQUE (RT) SEATING TORQUE (from structural analysis) LOCKING TORQUE (measured) **LUBRICATION:** All the **flight** fasteners shall be installed in LUBRICATED condition (according to the structural analysis) (see also Appendix)

### 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS) CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER 21. OPERATIONS SEQ. NO. (Print, Type, or Write Legibly) 22. TECH 23. QA/DV NOTES: 1) This ATS will not cover the following items. ATS/Procedure number TTCS Helium leak test procedure AMSTR-NLR-PR-070 TTCS Proof pressure procedure AMSTR-NLR-PR-071 FM\_TTCB\_Filling\_and\_venting\_procedure AMSTR-SYSU-PR-024 TTCB and condenser tube cutting procedure AMSTR-NLR-PR-008 iss04 TTCS\_Grounding\_verifications AMSTR-NLR-PR-072 TTCB and condenser integration welding into AMSTR-NLR-PR-067 TTCS-loops TTCS\_Loop\_connection\_check AMSTR-NLR-PR-076 TTCB\_Functional\_check\_procedure AMSTR-NLR-PR-027 TTCS Pinch and close procedure AMSTR-NLR-PR-074 **Drawing Package TTCB-Primary** ET5998-06-DRP- TTCB-PRIMARY-FM **Drawing Package TTCB-Secondary** ET5998-08-DRP-TTCB-SECONDARY-FM 1) This ATS includes TTCB-primary and TTCB-Secondary installation

# AMS-02 TASK SHEET (ATS) CONTINUATION PAGE 4. ATS NO. TTCS-090908-01 R1

20. OPER			CATION
SEQ. NO.			23. QA/DV
1.	Open this ATS  NOTE: the following note and pictures shall be used as reference during the step by step procedure.		

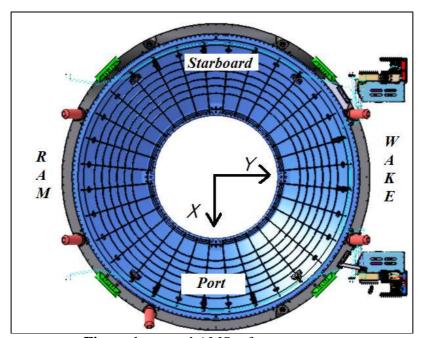
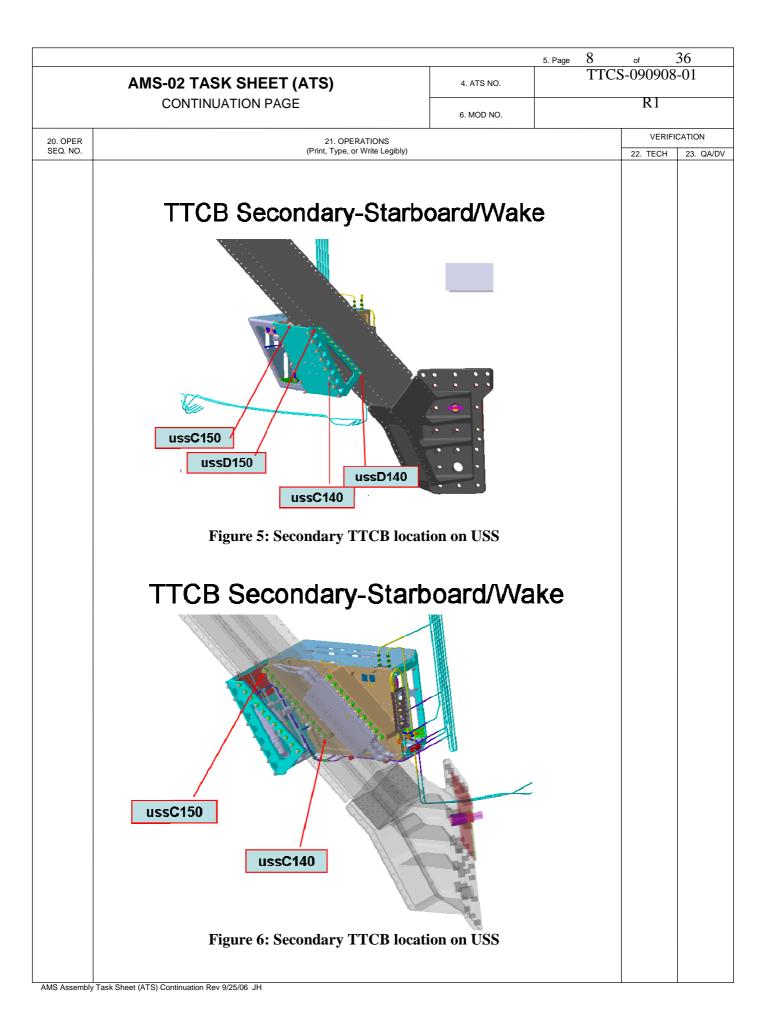


Figure 1: general AMS reference system

## 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** RI 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV TTCB Primary-Port/Wake ussB150 ussB140 ussA150 ussA140 Figure 2: Primary TTCB location on USS TTCB Primary-Port/Wake ussB150 ussB140 Figure 3: Primary TTCB location on USS AMS Assembly Task Sheet (ATS) Continuation Rev 9/25/06 JH

## 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** RI 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV TTCB Primary-Port/Wake ussB103 ussB111 ussB112 From 103 to 111 shared with TRD gas Figure 4: Primary TTCB location on USS AMS Assembly Task Sheet (ATS) Continuation Rev 9/25/06 JH



## 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS) CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV TTCB Secondary-Starboard/Wake ussC103 ussC112 Figure 7: Secondary TTCB location on USS Record and weight the **flight** hardware to be installed. Fill the table in 2. Appendix A **OFF-LINE OPERATIONS** Note: No lifting operations are required for the off line steps. AMS Assembly Task Sheet (ATS) Continuation Rev 9/25/06 JH

# AMS-02 TASK SHEET (ATS) CONTINUATION PAGE 5. Page 10 of 36 TTCS-090908-01 R1

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20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)			VERIFIC	
3LQ. NO.	(Fillit, Type, Or Write Legibly)			22. TECH	23. QA/DV
_					
3.	Preliminary operations TTCB-P				
	<b>3.1</b> Check that the following hardware is available:				
	o TTCB-P with:				
	o Protection caps on electrical connectors				
	o Properly closed ends to avoid contamination				
	o Cleaned bolts, washers and nuts (Flight and tempo				
	o Carton protection on start-up radiator				
	3.2 Check that the following operations have been				
	o Pinch inlet tubes welded to the box				
	o MLI installed on pumps				
	o Removal of kapton tape				
	o Preparations for pinch tube bracket installation on	the box			
	o Removal of green protection tape on baseplate and	side-plate I/F's			
	<b>3.3</b> Check that the following operations have been	performed on the	a IISS:		
	3.3 Check that the following operations have been	performed on the	c obb.		
	o Alodined area for grounding on I/F holes				
	o Protection foils (if any) removed				
	<b>3.4</b> Check that the following tools are available:				
	o Special long torque tool to torque inner row of bas	e plate bolts			
	o Pincers to keep washers in place				
	o Grease, Braycote 601EF (C1)				
	o Koroporon primer				

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	AMS-02 TASK SHEET (ATS)	4. ATS NO.	TTCS-090908-01					
	CONTINUATION PAGE	6. MOD NO.		R1				
20. OPER	21. OPERATIONS			VERIFI	CATION			
SEQ. NO.	(Print, Type, or Write Legibly)			22. TECH	23. QA/DV			
4. 4.1	INSTALLATION OF TTCB-P TO USS  Prepare the BASE PLATE for installation. Perform	a visual inspectio	on of the					
	parts to be installed; clean the parts to be installed with Isopropyl Alcohol and let the parts to be installed dry on the clean towel							
4.2	Prepare screws and washer to be used for the part installation. Perform a screws and washer visual inspection; clean screws and washers in an Isopropyl Alcohol bath and let screws and washers dry on a clean towel							
4.3	Perform a visual inspection of the USS check the cleanliness of all the inserts to be used. If necessary clean them with Isopropyl Alcohol							
4.4	Weight all the hardware to be installed, including in Appendix A.	fasteners. Record	d the weight					
4.5	WARNING: TTCB installation reference drawing of this ATS.  Verify before use the availability of the approved							
4.5.1	Only when indicated in drawing apply a thin layer between washers and base plate and or componen		mer in					
	Koropron primer - PN Lot#	_ Exp. Date						
4.5.2	Install the indicated components as shown in the f	igure below (rep	eat Figure 2)					
	TTCB Primary-Port/Wake  ussB140 ussA150 ussA150							

						5. Page 12	of .	36
	4110	O TAO!		· · · · · · · · · · · · · · · · · · ·		3 -	of -090908	
		2 TASK S	-	5)	4. ATS NO.			
	CO	ONTINUATIO	IN PAGE		6. MOD NO.		R1	
20. OPER				21. OPERATIONS	<u>.                                    </u>		VERIFI	CATION
SEQ. NO.				int, Type, or Write Legibly)			22. TECH	23. QA/DV
			V	VARNINGS:				
	AT LEAS	T TWO PE	RSONS AR	RE REQUIRED T	O HOLD THE TT	CB-P IN		
			PEOPLE TO	O INSTALL THE	BOLTS FOR TH			
			HAND '	TIGHT FIXATIO	)N			
4.5.3	Hand tigh	nten the bolt	S					
				DI AFFERS	<b>TIN</b> IC			
_				PLATE TORQU				
Base	Plate Inst	allation (	ET5998-	-06-3)	Thermal Was 14 x 6.7 x 4	her-15.7		
			Thermal Wash	er-15.7				
(Washer) l	NAS1587-4		14 x 6.7 x 4	X2		X 1	В	
(Screw)NA	AS1351N4-16			7				
	X1		/// 🏋	(15.7) 16x		sher)NAS:587-4	1	
		1	/·		(Screw	7)NAS1351N4-24		
		X	0008	- P88	(15.	X9	_	
		1000		000000	<b>3</b>			
					63			
			11x (15.6)	00000000	Thermal Wash	ner-157		
					14 x 6.7 x 4			
		11:x	15.7			Ж 22		
Г	_	Torque	(in*lbf)			1	_	
	Dash Number	Max	Min		(Washer)	NAS1587-4		
	AS1351N4-16	102.375	87.019		(Screw)N	IAS1351N4-16		
	AS1351N4-24	102.375	87.019					
_ N	AS1351N4-20	102.375	87.019			X 11		
		Figure 8	8: Connecti	on base plate to U	JSS			
4.6.1	Apply a t	hin layer of	Grease, Br	aycote 601EF (C	l), to the threads of	f each bolt		
		•		on the assembly	• •			
	Bravcote G	rease - PN		Lot#	Exp. Date			
	Diaycole O	10000 111		1				

					- 12		26		
	AMS-02 TASK SH	FFT (ATS)		4. ATS NO.	5. Page 13 TTC:		of 36 090908-01		
	CONTINUATION	• •				R1			
				6. MOD NO.		T			
20. OPER SEQ. NO.		21. OPERA (Print, Type, or V				22. TECH	CATION 23. QA/DV		
4.7	Install the fasteners as pe hand)	er figure 8 and rec	cord fasten	ers lot number (	write by				
	USE INSTALLATION I				2_9				
	These will be temporary USE FLIGHT BOLTS F								
	Use TTCS numbering to	be able to track	ITCB insta	allation running	torques				
	Bolt/washer/nut and num	iber NAS nu	mber	LOT					
		LOT#							
		LOT#							
			L	OT#					
			L	OT#					
			L	OT#					
			L	OT#					
4.8	Torque the fasteners inst	alled in the forme	er step to th	ne final torque v	alue. Seating				
	torque values are shown	in below table.	_						
	Dash Number	Torque	(in*lbf)						
	Dasii Namoti	Max	Mi	n					
	NAS1351N4-16	102.375	87.0	19					
	NAS1351N4-24	102.375	87.0	19					
	NAS1351N4-20	102.375	87.0	19					
4.9	Check this value with the Locking torque shall be i								
4.10	Check this value with Ta	ble 1 at the start o	of this ATS	S. Final torque s	hall be the				
	seating torque ABOVE I								
	İ					1			

						5. Page 14	of .	
- 1	AMS-02 TASK S	SHEET (AT	ΓS)		4. ATS NO.	TTC	S-090908	-01
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			21. OPERATIONS				VERIFIC	CATIC
		(P	rint, Type, or Write Le				22. TECH	23.
I	Base Plate Inst	allation (	ET5998-0	06-3)		Thermal Washer-	457	
		,	Thomal Washer			14x67x4		
:39	/asher) NAS1587-4		Ha (7 a4	1-147	Ixe,	The state of the s	x (	ε
.0.	new;EAS1351E4_16		1		7			Η.
	2.1	RP	USS_2_1	RP II	SS 2 9		0FAS1507-4	
				X:/	×	(Screw 04)	AF135104-24	-
	BP_USS_1_1		8880	999			X 2	
	21_000_1_1							
		1.66		8888	9999			
					000000			_
	BP USS 3 1	BP US:	S 3 11	9999		Thomas Washer 1 14 x 6 7 x 4	25-7	
	21 000 3 1		(15.7)			•	x o	_
		Torque	(in*1bf)	<b>4</b>	3		A 40	
		4 334 54955	101 101/					
	Dash Number	Max	Min			(Washer DA)	31587-4	_
	Dash Number NAS1351N4-16		•			(Washer DA)	<u> </u>	
		Max	Min				18:11:4-16	
	NAS1351N4-16	Max 102.375	Min 87.019				<u> </u>	
_	NAS1351N4-16 NAS1351N4-24	Max 102,375 102,375 102,375 ing Torque	Min 87.019 87.019 87.019 (locking is t		C	(Coresidas)	18:11:4-16	
PN _	NAS1351N4-16 NAS1351N4-24 NAS1351N4-20 Jue Wrench- Lock	Max 102.375 102.375 102.375 ing Torque M#	Min 87.019 87.019 87.019 (locking is t		C	(Coresidas)	18:11:4-16	
PN _ Torq	NAS1351N4-16 NAS1351N4-24 NAS1351N4-20 Jue Wrench- Lock	Max 102,375 102,375 102,375 ing Torque M# Torque	Min 57.019 87.019 87.019 (locking is t	_ Cal I	Due Date	que)	18:11:4-16	

# 15 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV Bolt indication (see figure above) Locking Torque **Final Torque** 4.11 End of online operation base plate to USS

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	ΑN	//S-02 TASK SHEET (ATS)		4. ATS NO.	TTC	S-090908	-01				
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20. OPER SEQ. NO.		21. OPERA (Print, Type, or V				VERIFIC 22. TECH	CATION 23. QA/DV				
						125					
.12	SIDE	PLATE TORQUING TO USS									
4.13	Prepare to be in parts to										
4.14	and wa	Prepare screws and washer to be used for the part installation. Perform a screws and washer visual inspection; clean screws and washers in an Isopropyl Alcohol bath and let screws and washers dry on a clean towel									
4.15	Perform a visual inspection of the USS check the cleanliness of all the inserts to be used. If necessary clean them with Isopropyl Alcohol										
4.16	Weight Append	t all the hardware to be installed, in dix A.	ncluding fa	steners. Record	d the weight in						
		ITEM	WEIGHT								
	SCAL	E									
4.17	PN_	M#		Cal Date							

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	AMS-02 TASK SHEET (ATS)	4. ATS NO.	TTC	S-090908	-01
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20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	1	1	VERIFIC 22. TECH	CATION 23. QA/DV
4.18	WARNING: TTCB installation reference drawing of this ATS.  Verify before use the availability of the approved			ZZ. IEGH	23. QA/DV
4.18.1	Check the bill of material in the assembly drawing	g.			
4.18.2	Only when indicated in drawing apply a thin layer between washers and base plate and or componen		mer in		
	Koropron primer - PN Lot#	_ Exp. Date			
4.18.3	Install the indicated components as shown in the f	figure below.			
	(Nut)NAS1789C4M  Thermal Washer -15.6 14 x 6.7 x 3  Thermal Washer -15.7 14 x 6.7 x 4  (Screw)NAS1351N4-20	.6	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		2000
4.18.4	Figure 4: Connection side plate to USS  Apply a thin layer of Grease, Braycote 601EF (C)		of each bolt		
	prior the installation (as reported on the assembly	drawings).			
	Braycote Grease - PN Lot# I	Exp. Date			

					5. Page 18		36
A	MS-02 TASK SH	IEET (ATS)	4	. ATS NO.	TTCS	S-090908	-01
	CONTINUATIO	N PAGE	6. MOD NO.		R1		
ER NO.		21. OPERA (Print, Type, or W			1		CATION
9 Instal hand)	l the fasteners as po	er figure 4 and rec	ord fasteners lo	t number (v	write by	22. TECH	23. QA/DV
	FLIGHT BOLTS washer/nut and num	nber NAS nu	mber ]	LOT			
			LOT#_				
			LOT#_				
			LOT#_				
	LOT#						
	LOT#						
			LOT#_				
			LOT#_				
			LOT#_				
_	ue the fasteners inste e values are shown		•	•	alue. Seating		
	ash Number	Max	Min	1			
N/	AS1351N4-20	102.375	87.019	j			
Checl	c this value with th	e table at the end	of this ATS.				
Locki	Locking torque shall be in between 3.5-30 inch*lbf (size 0.250).						
	this value with Ta torque shall be the			G TORQU	IE.		

### 5. Page 19 36 TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** R1 **CONTINUATION PAGE** 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV 5% precision on torque. (Nut)NAS1789C4M SP USS 1 .... SP USS 11 Thermal Washer -15.6 $14 \times 67 \times 3$ Thermal Washer -15.7 $14 \times 67 \times 4$ (Screw)NAS1351N4-20 X 11 Torque Wrench- Locking Torque (locking is the same as running torque) PN \_\_\_\_\_ M# \_\_\_\_ Cal Due Date\_\_\_\_ Torque Wrench- Final Torque M# \_\_\_\_\_ Cal Due Date\_\_ **Bolt indication (see figure above)** Locking Torque **Final Torque**

### 20 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. R1 **CONTINUATION PAGE** 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV Bolt indication (see figure above) Locking Torque **Final Torque** 4.23 End of online operation TTCB-P side plate to USS 4.24 CHECK ACCES FOR PINCHING AND FILLING 4.25 PERFORM TUBE CUTTING (PIPE CUTTER) AND DEBURRING PER AMSTR-NLR-PR-008 TTCB and condenser tube cutting procedure 4.26 PERFORM TTCB-P WELDING ACCORDING TO AMSTR-NLR-PR-067 4.27 PERFORM TTCB-P GROUNDING CHECK ACCORDING TO AMSTR-NLR-PR-072 **OFF-LINE OPERATIONS TTCB-S** Note: No lifting operations are required for the off line steps.

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AMS-02 TASK SHEET (ATS)	4. ATS NO.	TTCS	S-0909	08-01	
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	CONTINUATION PAGE	6. MOD NO.		R1	
20. OPER	21. OPERATIONS			VERIFIC	CATION
SEQ. NO. <b>5.</b>	Preliminary operations TTCB-S		22.	TECH	23. QA/DV
3.					
	<b>5.1</b> Check that the following hardware is available:				
	o TTCB-S with:				
	o Protection caps on electrical connectors				
	o Properly closed ends to avoid contamination				
	o Cleaned bolts, washers and nuts (Flight and tempo	orary) as listed in	this ATS		
	o Carton protection on start-up radiator				
	<b>5.2</b> Check that the following operations have been	performed on the	e TTCB-P:		
	o Pinch inlet tubes welded to the box				
	<ul><li>MLI installed on pumps</li><li>Removal of kapton tape</li></ul>				
	o Preparations for pinch tube bracket installation on	the box			
	o Removal of green protection tape on baseplate and	d side-plate I/F's			
	5.2 Check that the following amountions have been	manfannad on th	a LICC.		
	5.3 Check that the following operations have been	i periormed on th	le USS:		
	o Alodined area for grounding on I/F holes				
	o Protection foils (if any) removed				
	<b>5.4</b> Check that the following tools are available:				
	<ul> <li>Special long torque tool to torque inner row of bas</li> </ul>	se plate bolts			
	o Pincers to keep washers in place				
	o Grease, Braycote 601EF (C1)				
	o Koroporon primer				
5.5	End of online operation TTCB-P side plate to USS				
	v Task Sheet (ATS) Continuation Rev 9/25/06 JH				

# AMS-02 TASK SHEET (ATS) CONTINUATION PAGE 4. ATS NO. TTCS-090908-01 R1

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	CONTINUATION PAGE	6. MOD NO.		R1	
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)	•		VERIFIC 22. TECH	CATION 23. QA/DV
5.	INSTALLATION OF TTCB-S TO USS			ZZ. TLOTT	23. QAVDV
6.1	Prepare the BASE PLATE for installation. Perform a parts to be installed; clean the parts to be installed w the parts to be installed dry on the clean towel	_			
6.2	Prepare screws and washer to be used for the part instand washer visual inspection; clean screws and washbath and let screws and washers dry on a clean tower.	ners in an Isoprop			
6.3	Perform a visual inspection of the USS check the c be used. If necessary clean them with Isopropyl Alco		the inserts to		
6.4	Weight all the hardware to be installed, including in Appendix A.	fasteners. Record	d the weight		
6.5	WARNING: TTCB installation reference drawing of this ATS.  Verify before use the availability of the approved				
6.5.1	Only when indicated in drawing apply a thin layer between washers and base plate and or component		mer in		
	Koropron primer - PN Lot#	_ Exp. Date			
6.5.2	Install the indicated components as shown in the f	igure below (rep	eat Figure 5)		
	TTCB Secondary-Starboard/Wald ussC150 ussC140	<b>«e</b>			

WARNINGS:  AT LEAST TWO PERSONS ARE REQUIRED TO HOLD THE TTCB-P IN PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  6.6.1 Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  14 x 6.7 x 4  (Washer) NAS1587-4	
CONTINUATION PAGE  21. OPERATIONS (Print, Type, or Write Legibly)  WARNINGS:  AT LEAST TWO PERSONS ARE REQUIRED TO HOLD THE TTCB-P IN PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  (Washer) NAS1351N4-16  (Washer) NAS1351N4-16  (Washer) NAS1351N4-16  (Washer) NAS1351N4-16  (Washer) NAS1351N4-16	
WARNINGS:  AT LEAST TWO PERSONS ARE REQUIRED TO HOLD THE TTCB-P IN PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7    Thermal Washer-15.7   Taylor   Thermal Washer-15.7   Taylor   Thermal Washer-15.7   Therma	NC
WARNINGS:  AT LEAST TWO PERSONS ARE REQUIRED TO HOLD THE TTCB-P IN PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  It x 6.7 x 4  (Washer) NAS1587-4	NC
WARNINGS:  AT LEAST TWO PERSONS ARE REQUIRED TO HOLD THE TTCB-P IN PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  6.6.1 Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  14 x 6.7 x 4  (Washer) NAS1587-4	. QA/DV
AT LEAST TWO PERSONS ARE REQUIRED TO HOLD THE TTCB-P IN PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  6.6.1 Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  14 x 6.7 x 4  (Washer) NAS1587-4  (Washer) NAS1587-4  (Washer) NAS1587-4  (Screw) NAS1351N4-16	
PLACE AND TWO PEOPLE TO INSTALL THE BOLTS FOR THE FIRST HAND TIGHT FIXATION  6.5.3 Hand tighten the bolts  TTCB-S BASE PLATE TORQUING  6.6.1 Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  14 x 6.7 x 4  (Washer) NAS1587-4  (Washer) NAS1581N4-16  (Washer) NAS1351N4-16  (Washer) NAS1351N4-2	
5.6 TTCB-S BASE PLATE TORQUING  6.6.1 Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  [(Washer) NAS1587-4  [(Screw)NAS1351N4-16]  [(Washer) NAS1587-4  [(Screw)NAS1351N4-2]	
Install the indicated components as shown in the figure below.  Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  14 x 6.7 x 4  (Washer) NAS1587-4  (Screw) NAS1351N4-16  (Washer) NAS1587-4  (Screw) NAS1351N4-2-2	
Base Plate Installation (ET5998-06-3)  Thermal Washer-15.7  14 x 6.7 x 4  (Washer) NAS1587-4  (Washer) NAS1581N4-16  X 1  (Washer) NAS1581N4-16	
(Washer) NAS1587-4  (Washer) NAS1587-4  (Screw)NAS1351N4-16  (Washer) NAS1587-4  (Screw)NAS1351N4-2-2-2-3-2-3-2-3-3-3-3-3-3-3-3-3-3-3-3-	
(Washer) NAS1587-4  (Screw)NAS1351N4-16  X1  (Washer) NAS1587-4  (Screw)NAS1351N4-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	
Thermal Washer-15.7 14 x 6.7 x 4	<u> </u>
Torque (in*lbf)	22
Dash Number Max Min (Washed)NAS1537-4	
NAS1351N4-16 102.375 87.019 (Screw)NAS1351N4-16	7
NAS1351N4-24 102.375 87.019	11
NAS1351N4-20 102.375 87.019	
Figure 9: Connection base plate to USS  Apply a thin layer of Grease, Braycote 601EF (C1), to the threads of each bolt prior the installation (as reported on the assembly drawings).	
Braycote Grease - PN Lot# Exp. Date	

					5. Page 24		36
	AMS-02 TASK SH	EET (ATS)		4. ATS NO.	TTCS	S-090908-	-01
	CONTINUATION	I PAGE		6. MOD NO.		R1	
20. OPER SEQ. NO.		21. OPERAT (Print, Type, or Wr			<u>I</u>	VERIFIC	
6.7	Install the fasteners as pe hand) USE FLIGHT BOLTS Use TTCS numbering to	er figure 9 and reco	ord fasten		•	22. TECH	23. QA/DV
	Bolt/washer/nut and num	nber NAS nun	nber	LOT			
			L	OT#			
			L	OT#			
			L	OT#			
			L	OT#			
			L	OT#			
			L	OT#			
			L	OT#			
			L	OT#			
			L	OT#			
6.8	Torque the fasteners instatorque values are shown		step to th	ne final torque va	llue. Seating		
	Dash Number	Torque	(in*lbf)				
		Max	Mi	n			
	NAS1351N4-16	102.375	87.0	19			
	NAS1351N4-24	102.375	87.0	19			
	NAS1351N4-20	102.375	87.0	19			
6.9	Check this value with the Locking torque shall be i						
6.10	Check this value with Ta seating torque ABOVE I						

,					5. Page 25	of 3	6
-	AMS-02 TASK S	SHEET (AT	S)	4. ATS NO.	TTC	S-090908-	01
	CONTINUATION	-	-	6. MOD NO.		R1	
			21. OPERATIONS	C. MOD INC.		VERIFIC	ATIO
		(Pri	int, Type, or Write Legibl	у)		22. TECH	23.
Г	Base Plate Inst	allation (I	ET5998-06	-3)	Thermal Washer-	5.7	
					14 x 6 7 x 4		
	asher) NAS1087-4 -		Thermal Washer-19 14 × 0.7 × 4	Y XS,	and the same of th	x (s	
:0:	rew;15AS1351B4-16		A	<u> </u>		•	1
	Х 1	RP	IISS 2 1	BP_USS_2_9		FAS1507-4	
			000_0_1	<u> </u>	(Screw 04A	E135104-24	
	BP_USS_1_1		088889	•	-	X 2	
				100			
		1/2		3399999			
			1	00000000			
	BP USS 3 1	BP USS	3 11	200	Thomas Washin-1: 14 x 6.7 x 4	7	
		***	-(s)		•	xx	_
		T-orque (	in*lbt)			77.50	_
	Dash Number	Max	Min		(Washerd) A2	1587-4	
	NAS1351N4-16	102,375	87.0L9		(Screw)NAST	01104.16	
	NAS1351N4-24	102.375	87.01.9			XII	-
	NAS1351N4-20	102.375	87.019				_
Torq		· · · · · ·		e same as running tor	que)		
		3.40		Cal Due Date			
PN		IVI#		Car Dae Date			
	W 1 7 1						
	ue Wrench- Final						

# 26 36 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV Bolt indication (see figure above) Locking Torque **Final Torque** 6.11 End of online operation TTCB-S base plate to USS

			1		5. Page 27		36
	AN			4. ATS NO.	TTCS	S-090908	-01
		CONTINUATION PAGE		6. MOD NO.		R1	
20. OPER SEQ. NO.						VERIFIC 22. TECH	CATION 23. QA/DV
	SIDE P	LATE TORQUING TO USS					
7.1	to be in	nstalled; clean the parts to be install	led with Isc				
7.2	and wa	sher visual inspection; clean screw	s and wash	ers in an Isoprop			
7.3	1	•			the inserts to		
7.4	_		ncluding fa	steners. Record	the weight in		
		ITEM	WEIGHT				
			,, Elolli				
	SCAL	E					
7.5	PN_	M#	C	Cal Date			

			5. Page 28	of 3	36
	AMS-02 TASK SHEET (ATS)	4. ATS NO.	TTC	S-090908-	-01
	CONTINUATION PAGE	6. MOD NO.		R1	
20. OPER SEQ. NO.	21. OPERATIONS (Print, Type, or Write Legibly)			VERIFIC 22. TECH	CATION 23. QA/DV
7.6	WARNING: TTCB installation reference drawing of this ATS.  Verify before use the availability of the approved			ZZ. IEUN	23. QA/DV
7.6.1	Check the bill of material in the assembly drawing	g.			
7.6.2	Only when indicated in drawing apply a thin layer between washers and base plate and or componen		mer in		
	Koropron primer - PN Lot#	_ Exp. Date	<del></del>		
7.6.3	(Nut)NAS1789C4M  Thermal Washer -15.6 14 x 6.7 x 3  Thermal Washer -15.7 14 x 6.7 x 4  (Screw)NAS1351N4-20  X 11	figure below.		15.7	18x
7.6.4	Apply a thin layer of Grease, Braycote 601EF (C) prior the installation (as reported on the assembly	drawings).			
	Braycote Grease - PN Lot# I	Exp. Date	<del></del>		

					5. Page 29	of 36	
	AMS-02 TASK SH	EET (ATS)		4. ATS NO.	TTC	S-090908-0	)1
	CONTINUATION	N PAGE		6. MOD NO.		R1	
20. OPER		21. OPER/	ATIONS			VERIFICAT	TION
SEQ. NO.		(Print, Type, or V				22. TECH 2	23. QA/DV
7.7	Install the fasteners as polaridate hand) USE FLIGHT BOLTS	er figure 4 and red	cord fasten	ers lot number (	write by		
	Bolt/washer/nut and nun	nber NAS nu	ımber	LOT			
			L	OT#			
			L	OT#			
			L	OT#			
				OT#			
				OT#			
	<del></del>						
	<del></del>			OT#			
				OT#			
				OT#			
			L	OT#			
7.8	Torque the fasteners inst torque values are shown		er step to th	ne final torque v	alue. Seating		
	Dash Number	Torque	(in*lbf)				
	Dasii Number	Max	Min				
	NAS1351N4-20	102.375	87.01	9			
7.9	Check this value with the	e table at the end	of this AT	S.			
	Locking torque shall be	in between 3.5-30	) inch*lbf	(size 0.250).			
7.10	Check this value with Ta Final torque shall be the precision on torque.				JE, 5%		

### 5. Page 30 36 TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. R1 **CONTINUATION PAGE** 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV (Nut)NAS1789C4M SP USS 1 .... SP USS 11 Thermal Washer -15.6 $14 \times 67 \times 3$ Thermal Washer -15.7 14 x 6 7 x 4 (Screw)NAS1351N4-20 X 11 Torque Wrench- Locking Torque (locking is the same as running torque) Torque Wrench- Final Torque M# \_\_\_\_\_ Cal Due Date\_\_ **Bolt indication (see figure above)** Locking Torque **Final Torque**

### 36 31 5. Page TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. R1 **CONTINUATION PAGE** 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV Bolt indication (see figure above) Locking Torque **Final Torque** 7.11 End of online operation side plate to USS 7.12 CHECK ACCES FOR PINCHING AND FILLING 7.13 PERFORM TUBE CUTTING (PIPE CUTTER) AND DEBURRING PER AMSTR-NLR-PR-008 TTCB and condenser tube cutting procedure 7.14 PERFORM TTCB-S WELDING ACCORDING TO AMSTR-NLR-PR-067 7.15 PERFORM HYDRAULIC CONNECTOR FIT CHECK 7.16 PERFORM TTCB-S GROUNDING CHECK ACCORDING TO AMSTR-NLR-PR-072 7.17 **CLOSE THIS ATS**

					5. Page 32		36
	AN	MS-02 TASK SHEET (ATS)		4. ATS NO.	TTC	S-090908	-01
		CONTINUATION PAGE		6. MOD NO.		R1	
20 OPED		O4 OPERA	TIONS			VERIFIC	CATION
20. OPER SEQ. NO.		21. OPERA (Print, Type, or V				22. TECH	23. QA/DV
8.	APP be in	ENDIX A. Record the weight of astalled, including fasteners.	f all the T	TCB-P flight ha	ardware to		
		ITEM		WEIGHT			

# 5. Page 33 36 TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV **SCALE** PN \_\_\_\_\_ M# \_\_\_\_ Cal Date\_\_\_\_

				5. Page 34		36
	AN	NS-02 TASK SHEET (ATS)	4. ATS NO.	TTC	CS-090908	-01
		CONTINUATION PAGE	6. MOD NO.		R1	
20. OPER SEQ. NO.		21. OPER. (Print, Type, or				CATION
9.	APP be in	ENDIX B. Record the weight on stalled, including fasteners.	TCB-P flight h	ardware to	22. TECH	23. QA/DV
		ITEM	WEIGHT			

# 5. Page 35 36 TTCS-090908-01 **AMS-02 TASK SHEET (ATS)** 4. ATS NO. **CONTINUATION PAGE** R1 6. MOD NO. VERIFICATION 20. OPER SEQ. NO. 21. OPERATIONS (Print, Type, or Write Legibly) 22. TECH 23. QA/DV **SCALE** PN \_\_\_\_\_ M# \_\_\_\_ Cal Date\_\_\_\_

#### 

**10.** Appendix C: Seating Torque values

	Bolt		Insert/No	ut	Washe	er .		
							Torque	e(in*lbf)
Joints	Dash Number	Number	Dash Number	Number	Dash Number	Number	Max	Min
RD_Brackets_TTCB_Shar ed	NAS1351N4-24	9	MS21209 F4-15	9	NAS1587-4	9	102.375	87.019
Base plate &USS	NAS1351N4-16	12	MS21209F4-15	12	NAS1587-4	12	102.375	87.019
Side plate &USS	NAS1351N4-20	11	NAS1789C4M	11	no	11	102.375	87.019
Start up radiator &base/sideplate	NAS1351N3-16	16	MS21209F1-25	16	NAS1149E0363R	16	42.237	35.901
	NAS1352N08-8	10	MS21209C0820	10	NAS1149EN832R	10	24.944	21.203
cover &base	NAS1352N06-6	2	NAS1330-06-106	2	no	0	13.861	11.782
Accumulator bracket &base plate	NAS1351N3-16	8	MS21209F1-15	8	NAS1149E0363R	8	42.237	35.901
Pump Bracket &start up radiator	NAS1352N06-10	8	NAS1291C06M	8	NAS1149EN532R	8	13.861	11.782
Aps/Dps &Base plate	NAS1352N08-14	8	MS21209C0820	8	NAS1149EN832R	8	24.944	21.203
HX& Base plate	NAS1351N3-16	8	MS21209 F1-15	8	NAS 620 10 LC	8	42.237	35.901
Cold orbit heater &base plate	NAS1352N08-10	4	MS21209C0820	4	NAS1149EN832R	4	24.944	21.203
Controller &base plate	NAS1351N3-10	6	MS124695 10- 32X1.5dia	6	no	0	42.237	35.901
Cover&CoverRibs	NAS1352N06-6	25	NAS1330-06-106	25	NAS1149EN532R	25	13.861	11.782
Cover Rib&Baseplate	NAS1352N06-12	2	NAS1330-06-106	2	no	0	13.861	11.782
Preheater&Baseplate	NAS1352N04-LB-6	8	no	0	no	0	7.459	6.34
ConnectorsPlate&Cover	NAS1352N06-6	10	NAS1330-06-106	10	NAS1149EN532R	10	13.861	11.782
PressSensors&Cover	NAS1352N06-8	8	MS21209C0620	8	no	0	13.861	11.782
PipeClamp&BasePlate	NAS1352N08-8	4	MS21209C0820	4	no	0	24.944	21.203
PipeClamp&PipeClamp	NAS1352N06-6	8	MS21209C0610	8	no	0	13.861	11.782
ClampBracker&Collar	NAS1351N08-LB14	7	no	0	NAS1149EN832R	7	26.863	22.834
Pipe-Fix&Clamp	NAS1351N06-10	8	MS21209F0625	8	NAS1149EN532R	8	15.662	13.312
Press&Saddle	NAS1351N08-12	8	MS21209F0820	8	NAS1149EN832R	8	26.863	22.834